

## Patent claims

## Claim 1

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✓ ✓ Light guiding blinds (40 through 43, 51, 52) having at least partly prism-molded toothed upper sides (54), said prismatic molding being provided at least in the portion of the blinds disposed towards the irradiation area (104) and serving for deflecting daylight, said prismatic molded teeth of one prism side showing towards sun incidence and with one reverse prism side showing towards the interior space, and two blind edges each on the sun incidence side forming an incidence cross section (44) and two blind edges each on the interior space side forming a deflection cross section, and a blind edge of a lower blind each in the incidence cross section and a blind edge of an upper blind each in the deflection cross section forming an angle ( $\alpha_s$ ) relative to the level of the inner blind edges, and sun irradiation impinging from outside being back-reflected at an angle ( $\alpha_R$ ) relative to the level of the outer blind edges in the direction of the outer space, the front side being the sun incidence side, characterized in that

- a) the individual prismatic tooth sides showing towards sun incidence have angles of inclination ( $\beta$ ) relative to the horizontal essentially smaller in the area of the irradiation cross section (44) and larger at larger distance from the irradiation cross section (44), and
- b) the angles of inclination ( $\beta$ ) of the individual teeth and/or the tooth sides of the teeth (106, 107) showing towards sun incidence increase continuously or discontinuously or irregularly following a concave curve path (47) increasingly ascending starting from the irradiation area towards the interior space, and
- c) at the upper side of light guiding blinds (41, 51) back-reflected radiation (82) is concentrated and a concentration zone (46, 53) is formed near irradiation cross section (44), said concentration zone (46, 53), either by rotating the blinds or by using the changed angle of incidence of the sun, is disposed either in front of blind (42) in the irradiation cross

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section (46) and/or on the underside (53) of upper blind (52) behind the irradiation cross section (44), and

- d) on the upper side of the light guiding blind (51, 41) back-reflected light radiation may be back-reflected at the individual teeth at an angle ( $\alpha_R < \alpha_S$ ), the back reflection angle ( $\alpha_R$ ) into the outer space being smaller than the angle ( $\alpha_S$ ) between two blind edges each of a lower blind in the irradiation cross section (44) and an upper blind in the deflection cross section..

Claim 2

Installation according to claim 1, characterized in that said light guiding blinds are readjusted in a position through which at the upper side of said blinds retro-reflected light radiation (56) impinges at an angle  $\gamma < 90^\circ$  on the underside of blinds (55).

Claim 3

Installation according to claim 1, characterized in that said light guiding blinds are manufactured by a rolling process as a flat blind having uniform tooth formation and by subsequent concave/convex molding of the blind the individual teeth are brought into their ascending angular position  $\beta$ .

Claim 4

Installation according to claim 1, characterized in that said light guiding blinds include at least one portion (105, 108) oriented towards the interior space which, at least vis-à-vis a first portion (104), includes flatter tooth angles  $\beta$  or no tooth angles and may be plane, concave or convex arch shaped.

Claim 5

Installation according to claim 1, characterized in that said light guiding blinds (100 through 103) are S-shaped.

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## Claim 6

Installation according to claim 1, characterized in that said light guiding blinds (Figure 7) consist of at least one retro-reflective part and at least one second light guiding element for light guidance towards the interior space wherein said retro-reflector consist of at least two teeth (106, 107), the first tooth (106) including on the side facing the sun light a flat angle of inclination  $\beta$ , and at least one further tooth (107) including a steeper angle of inclination  $\beta$ , and that at least the sun-irradiated sides of the teeth are concavely arched.

## Claim 7

Installation according to claim 1, characterized in that said blinds consist of at least one retro-reflective part and at least one second light guiding element for light guidance towards the interior space wherein said retro-reflector consists of at least one single tooth, at least the sun-irradiated side of said tooth being concavely arched.

## Claim 8

Installation according to claim 1, characterized in that said light guiding blind upper sides are a holograms.

## Claim 9

Installation according to claim 1, characterized in that on the underside in the area of portion (54) of blinds (52) disposed towards the irradiation area, energy converters for short-wave radiation into long-wave radiation and/or into current are provided.

## Claim 10

**Process of production** of light guiding prismatic surfaces according to claim 1 in a rotary process by feeding carrier material through a pair of rollers having structured surface, characterized in that microstructuring **of said carrier material** is obtained by means of a sol-gel coating into which either a prismatic-microstructured surface is embossed by a rotary embossing roller or a prismatic-

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microstructured surface is imprinted by a rotary printing roller, and which before, during or immediately after embossing or imprinting receives at least an initial curing by being fed electromagnetic radiation or by electron bombardment .

Claim 11

**Process of production** according to claim 10, characterized in that said sol-gel coating is a nanomer.

Claim 12

**Process of production** according to claim 10, characterized in that said sol-gel coating constitutes a synthesis of a viscous sol having a high solid content on an  $\text{SiO}_2$  base, curing after thermal treatment to constitute a vitreous layer.

Claim 13

**Process of production** according to claim 10, characterized in that the substrate of said sol-gel coating constitutes a synthesis of inorganic-organic nano composites.

Claim 14

**Process of production** according to claim 10, characterized in that said substrate of said sol-gel coating constitutes a polymerizing nano composite into which nano scale inorganic particles are incorporated.

Claim 15

**Process of production** according to claim 10, characterized in that into said substrate of said sol-gel coating precious metal colloids are incorporated.

Claim 16

**Process of production** according to claim 10, characterized in that said substrate of said sol-gel coatings is formed of polymerizable silanes and cures through photo polymerization under the irradiation of ultraviolet light

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## Claim 17

**Process of production** according to claim 10, characterized in that said substrate of said sol-gel coatings is produced by ceramic nano particles having a high metal oxide content ( $\text{SiO}_2$ ,  $\text{TiO}_2$ ).

## Claim 18

**Process of production** according to claim 10, characterized in that said coatings consist of hydrolyzed methacryl-oxypopyl-trimetoxyane and said micro structuring is imprinted by an embossing roller.

## Claim 19

**Process of production** according to claim 10, characterized in that said substrate of said sol-gel coatings consists of organically modified alkoxides and nano scale  $\text{SiO}_2$  particles into which prismatic structures < 30 nm are imprinted.

## Claim 20

**Process of production** according to claim 10, characterized in that said substrate of said sol-gel coatings is a metal colloid containing coating.

## Claim 21

**Process of production** according to claim 10, characterized in that the structure of the rollers for embossing or for imprinting is produced of an inorganic/organic nano composite material into which, either by photolithography and subsequent development or by photo structuring, holograms or Fresnel structures are incorporated through which, in the rotary molding or the rotary printing process, said sol-gel coating of the work piece becomes surface structured.

## Claim 22

**Process of production** according to claim 10, characterized in that said sol-gel coating applied onto said work piece is sprayed, in a second working step,

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with redistinguishable ITI nano particles and this sprayed-on layer cures under ultraviolet light as a protective layer.

Claim 23

**Process of production** according to claim 10, characterized in that the prismatically molded surfaces are covered with transparent conductive layers in that said layers of  $\text{In}_2\text{O}_3$ ,  $\text{SnO}_2$  and Sb are sprayed with high temperatures onto a hot work piece surface having temperature of more than  $300^\circ\text{C}$ .

Claim 24

**Process of production** according to claims 10 and 21, characterized in that said prismatically molded molding or printing rollers are structured having a low energy surface with self-structuring nano particles so that with a view to repulsion effects a self-purifying surface results on the work piece.

Claim 25

**Process of production** according to claim 10, characterized in that said prismatically molded molding or printing rollers are coated with a lubricant lacquer based on inorganic/organic nano composites.

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